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Neuronal Mechanisms of Intelligence.	AFOSR-83-0321

6. AUTHOR(S)		(2)
Larry Stein		

<p>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</p> <p>University of California College of Medicine Irvine, CA 92717</p>	<p>8. PERFORMING ORGANIZATION REPORT NUMBER</p> <p>AFOSR-TN- 00 0802</p>
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13. ABSTRACT (Maximum 200 words)

The equipment purchased on this grant is being used for on-line experimental control, data collection and data analysis on studies of the adaptive rules used by mammalian brain cells during conditioned behaviors.

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1. Equipment acquired.

The following list describes all equipment actually acquired by name, manufacturer, and cost. The purchased equipment was identical to that requested in our final revised equipment list dated 7 July 1983 except for the Data Plotting System. An alternative system with greater capability and similar price was substituted for the requested Tektronix System because the vendor was unable to provide the necessary software.

<u>Item Purchased</u>	<u>Manufacturer</u>	<u>Cost⁺</u>
Extracellular Preamplifiers (2-#2400)	Dagan Corp.	5,911
Iontophoresis & Pressure Injection System	Medical Systems Corp.	8,046
Computer Control System Components	Data General Corp.	36,281
Signal Discriminator System	Frederick Haer & Co.	5,318
Dual Microdrive System (2-Inchworm)	Burleigh Instruments, Inc.	8,555
Micromanipulators (2-Leitz)	McBain Instruments, Inc.	12,085
Dissecting Microscope (Wild M5APO)	McBain Instruments, Inc.	7,092
Storage Oscilloscope (R5223)	Tektronix, Inc.	10,848
Storage Oscilloscope (R5113)	Tektronix, Inc.	8,980
Data Plotting System (IBM-XT/HP7475)	Computerland/GTCO	12,408
Isolation Table (GS-34-ST)	Newport Corp.	2,954
Tape Recorder (PR260)	Ampex Corp.	10,070
Fixed Stage Microscope (Leitz Laborlux 12-FS)	McBain Instruments, Inc.	7,897
Mettler Balance w/printer (AE163/GA24)	VWR	3,631
Micropipette Puller	Frederick Haer & Co.	3,597
Rack Mount Equipment Cabinets (4)	Zack Electronics	3,302
	Total Expense	\$146,975
	Cost Sharing	(\$30,009)
	Grant Expenditure	\$116,966

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⁺Including tax and shipping.

2. Equipment usage.

All equipment has been used for on-line experimental control, data collection, and data analysis functions of our AFOSR-sponsored research entitled "Neuronal Mechanisms of Intelligence" (AFOSR Contract F49620-81-K-0015; AFOSR Grant 84-0325). In this work, we are investigating the adaptive rules used by mammalian brain cells in the mediation of intelligent behavior. The research is based on the assumption that human intelligence has evolved from the goal-seeking brain functions of lower forms, and that these functions in turn depend on a capacity for behavior to be strengthened or rewarded by its consequences (positive reinforcement). We furthermore assume that positive reinforcement of the intact organism is physiologically mediated at the level of the single neuron, rather than at the level of the multi-neuronal assembly or network. The equipment is being used in the performance of experiments designed to investigate whether individual cellular activity can be reinforced by locally applied electrical or chemical stimulation, and, if so, to establish the physiological and biochemical properties of such cellular reinforcement. Experiments are being conducted on single neurons in cell culture, brain tissue slices, and intact brain. The instrumentation permits recording of electrical activity of preselected neurons and reinforcement of particular activity patterns within precise temporal parameters by microinjection of neurotransmitters

3. Personnel

Larry Stein, Ph.D.
James Belluzzi, Ph.D.
Alan Fairhurst, Ph.D.
Charles Gorenstein, Ph.D.
Andrej Rotter, Ph.D.
David Gilbert, Ph.D.
Joel Black
Keith Trujillo
Karen Stevens
Eve Chan, M.S.
George Stupecky
Patricia Calahan
Bela Peller
Sharon Travers
Jim Johnston
Ajinder Chhabra
Paul Jaruszewski
Peter Ngai

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